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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/083,684	02/27/2002	Tomonari Yamamoto	020254	1544

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WESTERMAN, HATTORI, DANIELS & ADRIAN, LLP  
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WASHINGTON, DC 20036

EXAMINER
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ERDEM, FAZLI

ART UNIT	PAPER NUMBER
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2826

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/20/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/083,684

Applicant(s)

YAMAMOTO, TOMONARI

Examiner

Fazli Erdem

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 03 August 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-10, 12-14, 16-19, 21-23 and 25-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-4, 6-10, 12-14, 16-19, 21-23, 25 and 26 is/are allowed.
- 6) ☒ Claim(s) 27-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

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## DETAILED ACTION

### *Allowable Subject Matter*

1. Claims 1-4, 6-10, 12-14, 16-19, 21-23, 25 and 26 allowed.
2. The following is a statement of reasons for the indication of allowable subject matter:

Prior art failed to establish amorphization method in oblique directions as set forth in the independent claims.

### *Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 27 and 31 rejected under 35 U.S.C. 103(a) as being unpatentable over Toshiyuki et al. (6,906,548).

In claim 27, the claim language “the source and the drain regions are constituted by integrating a shallow junction seeping into said single crystal semiconductor under said gate and a deep junction extending under said shallow junction” and “impurities and atoms to amorphize said single crystal semiconductor” is considered product by process claim. The applicant’s claims 27 and 28 do not distinguish over the Toshiyuki et al. reference regardless of the process used to form the source/drain regions and amorphize the source/drain regions, because only the final product is relevant, not the recited process of using laser light in a linear beam with a particular power deviation. See *SmithKline Beecham Corp. v. Apotex Corp.*, Fed. Cir., No. 04-1522, 2/24/06 (“While the process set forth in the product-by-process claim may be new, that novelty can only be captured by obtaining a process claim.”)

Note that when “product by process” claiming is used to describe one or more limitations of a claimed product, the limitations so described are limitations of the claimed product per se, no matter how said product is actually made. In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a “product by process”

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claim and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in "product by process" claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. See also MPEP 706.03(e).

In *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d 1097 (2006), the Federal Circuit recently revisited the question of whether a "product by process" claim can be anticipated by a reference that does not recite said process. The Federal Circuit cited with approval this Office's current statement of the law, found in MPEP § 2113:

[Even] though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

*SmithKline Beecham*, 78 USPQ2d at 1101.

The Federal Circuit held this statement to be consistent with its own views on this topic, as well as various Supreme Court rulings, notably *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 373 (1938) ("Although in some instances a claim may validly describe a new product with some reference to the method of production, a patentee who does not distinguish his product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced."): *Id.*

Regarding Claim 27, Toshiyuki et al. disclose a semiconductor device where in Fig. 9 it is disclosed a semiconductor device having a gate 50, a source 42 and a drain region 44/45 wherein the source and the drain regions include a shallow portion 44 and a deeper portion 45 that seep under the gate electrode 50 and an overlap capacitance between gate and source region is 0.356 fF per micron as shown in column 6 lines 15-27, which is more than 0.25 fF per micron.

Regarding Claim 31, capacitance in column 6 lines 15-27 is a result of the overlap of the gate electrode and the source/electrode.

### ***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

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such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 28-30 and 32 rejected under 35 U.S.C. 103(a) as being unpatentable over Toshiyuki et al. (6,906,548) in view of Rodder (6,093,610).

In claim 29, the claim language “the source and the drain regions are constituted by integrating a shallow junction seeping into said single crystal semiconductor under said gate and a deep junction extending under said shallow junction” and “impurities and atoms to amorphize said single crystal semiconductor” is considered product by process claim. The applicant’s claims 27 and 28 do not distinguish over the Toshiyuki et al. reference regardless of the process used to form the source/drain regions and amorphize the source/drain regions, because only the final product is relevant, not the recited process of using laser light in a linear beam with a particular power deviation. See *SmithKline Beecham Corp. v. Apotex Corp.*, Fed. Cir., No. 04-1522, 2/24/06 (“While the process set forth in the product-by-process claim may be new, that novelty can only be captured by obtaining a process claim.”)

Note that when “product by process” claiming is used to describe one or more limitations of a claimed product, the limitations so described are limitations of the claimed product per se, no matter how said product is actually made. In re Hirao, 190 USPQ 15 at 17 (footnote 3). See also In re Brown, 173 USPQ 685; In re Luck, 177 USPQ 523; In re Fessmann, 180 USPQ 324; In re Avery, 186 USPQ 161; In re Wertheim, 191 USPQ 90 (209 USPQ 554 does not deal with this issue); and In re Marosi et al., 218 USPQ 289, all of which make it clear that it is the patentability of the final product per se which must be determined in a “product by process” claim and not the patentability of the process, and that an old or obvious product produced by a new method is not patentable as a product, whether claimed in “product by process” claims or not. Note that applicant has the burden of proof in such cases, as the above caselaw makes clear. See also MPEP 706.03(e).

In *SmithKline Beecham Corp. v. Apotex Corp.*, 78 USPQ2d 1097 (2006), the Federal Circuit recently revisited the question of whether a “product by process” claim can be anticipated by a reference that does not recite said process. The Federal Circuit cited with approval this Office’s current statement of the law, found in MPEP § 2113:

[Even] though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process.

*SmithKline Beecham*, 78 USPQ2d at 1101.

The Federal Circuit held this statement to be consistent with its own views on this topic, as well as various Supreme Court rulings, notably *Gen. Elec. Co. v. Wabash Appliance Corp.*, 304 U.S. 364, 373 (1938) (“Although in some instances a claim may validly describe a new product with some reference to the method of production, a patentee who does not distinguish his

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product from what is old except by reference, express or constructive, to the process by which he produced it, cannot secure a monopoly on the product by whatever means produced.”). Id.

Regarding Claim 29, Toshiyuki et al. disclose a semiconductor device where in Fig. 9 it is disclosed a semiconductor device having a gate 50, a source 42 and a drain region 44/45 wherein the source and the drain regions include a shallow portion 44 and a deeper portion 45 that seep under the gate electrode 50 and an overlap capacitance between gate and source region is 0.356 fF per micron as shown in column 6 lines 15-27, which is more than 0.25 fF per micron. Toshiyuki et al. fail to disclose the required source/seeping greater than the drain seeping and the required atom/impurity types. (Although in Fig. 9 of Toshiyuki et al. source region 42 extends further along the drain region 44 under gate electrode 50 Toshiyuki does not state this in the spec). However, Rodder disclose a self-aligned pocket process for deep sub micron CMOS devices and the device where in column 2, lines 32-50, source extension is made larger than the drain extension. Furthermore, in column 4, lines 55-65, to dope the source/drain regions, As (Arsenic) atom/impurity is used.

It would have been obvious to one of having ordinary skill in the art at the time the invention was made to include the required source extension and the required impurity doping in Toshiyuki et al. as taught by Rodder in order to form shallow drain extension as disclosed in column 4, lines 40-50 of Rodder.

Regarding Claims 28 and 30, Arsenic is used as the dopant in Rodder column 4, lines 55-65.

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Regarding Claim 32, capacitance in column 6 lines 15-27 of Toshiyuki et al, is a result of the overlap of the gate electrode and the source/electrode.


***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Fazli Erdem whose telephone number is (571) 272-1914. The examiner can normally be reached on M - F 8:00 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sue Purvis can be reached on (571) 272-1236. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

FE  
April 9, 2007

  
SUE A. PURVIS  
SUPERVISORY PATENT EXAMINER